IN THE SPECIFICATION:

(1) Please replace the paragraph beginning on page 1, line 3, with the following paragraph:

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--This present application claims priority from Provisional Application Serial No. 60/140,666 (filed June 24, 1999).--

(2) Please replace the paragraph beginning on page 2, line 8, with the following paragraph:

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--In order to address the reliability issues discussed above, a variety of approaches have been tried. For example, it is known that the best oxides for many IC devices are grown rather than deposited oxides. Furthermore, the higher growth temperatures may yield a better quality oxide. Unfortunately, there are problems associated with fabricating oxides at high temperatures by conventional techniques. For example, in achieving the high temperatures required in the high temperature oxide growth sequence, the overall thickness of the oxide grown tends to increase. As a result the oxide may be too thick for a reduced dimension device. Thus, in the effort to fabricate a better equality oxide, device scaling objectives may be defeated. Moreover, when cooling down from the high growth temperatures, the viscosity of the grown oxide increases and growth induced stress may result. Given these issues, it is customary in the semiconductor industry to grow oxides at low temperatures. The drawback to this practice is that by growing oxide at lower temperatures, the oxide quality may be compromised. This reduction in quality adversely impacts reliability of the oxide for reasons discussed above.--

(3) Please replace the paragraph beginning on page 6, line 20, with the following paragraph:

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--Turning to Fig. 2b, an illustrative sequence for fabricating the oxide layer 30 by fast thermal processing (FTP) is shown. (Cross sectional views of this exemplary growth sequence and the resulting oxide structure are shown in Figs. 3-5). Segment 200 indicates a wafer boat push step at an initial temperature of approximately 300°C-700°C, with nitrogen flow of 8.0L/min and 0.02 to 1% ambient oxygen concentration. These parameters are chosen to minimize the growth of native oxide, which can degrade oxide quality as well as consume the allowed oxide thickness determined by scaling parameters (referred to as oxide thickness budget or scaling budget). Additionally, a load lock system or a hydrogen bake, well known to one of ordinary skill in the art, can be used to impede the growth of this undesirable low-temperature oxide.--

(4) Please replace the paragraph beginning on page 6, line 30, with the following paragraph:

--Segment 210 is a rapid upward temperature increase at approximately 50-125°C per minute to about 750°C-850°C. This step is carried out at a very low oxygen ambient concentration (on the order of 0.05% to 5%) and a high nitrogen ambient. One aspect of the present embodiment relates to the step of upwardly ramping the temperature at a relatively high rate (segment 210) to minimize the thickness of the oxide formed in this segment (known as the ramp oxide). This helps control the overall thickness of the oxide 30. Thus, through this step, the desired higher growth temperatures (segments 230 and 260) may be attained without sacrificing the oxide thickness budget. Moreover, this rapid rise in temperature at low ambient oxygen concentrations retards the growth of lower temperature oxide, which may be of inferior quality, as discussed above.--

(5) Please replace the paragraph beginning on page 7, line 7, with the following paragraph:

--Segment 220 is a more gradual increase in temperature. Segment 220 proceeds at approximately 10-25°C per minute. In the exemplary embodiment the temperature reached at the end of segment 220 is in the range of approximately 800°C to 900°C. The same oxygen and nitrogen flows/concentrations used in segment 210 are maintained in segment 220. This control of the ramp up in temperature in segment 220 is also important as it helps to prevent overshooting the growth temperature of segment 230. Finally, the low concentration of oxygen in segment 220 selectively retards the growth of oxide during the temperature increase to a higher growth temperature. Again this helps to preserve the oxide thickness budget.--

A3 cont.

(6) Please replace the paragraph beginning on page 7, line 16, with the following paragraph:

--Segment 230 is a low temperature oxide (LTO) growth step. In this step, the ambient oxygen concentration is about 0.1% to about 10% while the ambient nitrogen concentration is 90-99.9%. Dichloroethylene may be added at 0-0.5% for a time that is dependent upon the desired thickness as would be appreciated by one of ordinary skill in the art. At the end of segment 230, an anneal in pure nitrogen may be carried out. In the illustrative sequence of Fig. 2, during segments 200-220 an oxide is grown having a thickness in the range of 5-10 Å. Segment 230 results in the growth of approximately 2.5-10 Å of oxide. Upon completion of segment 230, the growth of the first oxide portion 31 (in Fig. 4) is completed. Illustratively, this first oxide portion is grown at a temperature lower than the viscoelastic temperature of silicon dioxide (T_{ve}), which is approximately 925°C. The first oxide portion 31 may comprise 25-98% of the total thickness of the oxide layer 30. In an exemplary embodiment in which the oxide layer 30 has a thickness of 30 Å or less, the first oxide portion 31 has a thickness of approximately 7.5-20Å. As discussed more fully herein,

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applicants theorize that the first oxide portion 31 acts as a sink for stress relaxation that occurs during the growth of second oxide portion 32 under first oxide portion 31.--

(7) Please replace the paragraph beginning on page 7, line 32, with the following paragraph:

--Segment 240 is the first segment in the temperature increase to a temperature above the viscoelastic temperature of silicon dioxide. This ramp up in temperature occurs relatively slowly, at a rate of approximately 5-15°C per minute and in a nearly pure nitrogen ambient (the ambient concentration of oxygen in this segment is illustratively 0%-5%). The temperature reached at the end of segment 240 is approximately 50°C below the high temperature oxide (HTO) growth temperature of segment 260. Segment 250 is a modulated heating segment in which the temperature is increased at a rate of approximately 5-10°C per minute to a temperature above the viscoelastic temperature. In the illustrative embodiment the HTO growth temperature is in the range of 925-1100°C. The same flows/concentration of oxygen and nitrogen of segment 240 are used in segment 250. At the end of segment 250, the HTO growth temperature is reached.--

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(8) Please replace the paragraph beginning on page 8, line 10, with the following paragraph:

--Segments 240 and 250 are useful steps in the exemplary embodiment of the present invention. As was the case in the temperature ramp-up to segment 230 the (LTO growth segment) the careful ramp-up of temperature in segments 240 and 250 prevents overshooting the desired growth temperature, in this case the HTO growth temperature of the present invention. The rate of temperature increase at the illustrated low ambient oxygen concentration is useful in retarding oxide growth thereby preserving the oxide thickness budget. Finally, applicants believe that the careful

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heating in a low oxygen ambient in segments 240 and 250 reduces growth stress, and consequently a reduces the occurrence of oxide growth defects (e.g., slip dislocations and stacking faults).--

(9) Please replace the paragraph beginning on page 8, line 19, with the following paragraph:

--Segment 260 is the HTO growth step, where the growth temperature is illustratively above the viscoelastic temperature of silicon dioxide. The temperature achieved at the end of segment 250 is maintained in the growth step in segment 260 in a 25% or less oxygen ambient for approximately 2 to 20 minutes so that an additional 2-12 Å of oxide may be grown at high temperature. The second portion may comprise on the order of 2-75% of the total thickness of the oxide layer 30. The final portion of segment 260 may include an anneal in pure nitrogen. Applicants believe (again without wishing to be bound to such a belief) that the high temperature growth above the viscoelastic temperature (approximately 925°C) results in the growth of an oxide (second oxide portion 32) having certain properties.--

A3 cont.

(10) Please replace the paragraph beginning on page 9, line 1, with the following paragraph:

--Segment 270 of the exemplary embodiment of Fig. 2 is a cooling segment also referred to as a modulated cooling segment. A temperature ramp down is carried out at a rate of approximately 2-5°C per minute to a temperature at the end of segment 270 which is below the viscoelastic temperature. For example, the temperature reached at the end of segment 270 is in the range of 900-800°C. Segment 270 is carried out in a nearly pure nitrogen ambient, which is inert. During the cooling of a grown oxide to below the viscoelastic temperature, stress may result in the oxide, particularly at the substrate-oxide interface. As a result of this stress, defects such as slip

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dislocations and oxidation induced stacking faults may be formed at energetically favored sites such as heterogenities and asperities. These defects may be viewed as routes for diffusional mass transport and leakage current paths which can have a deleterious impact on reliability and device performance. The modulated cooling segment, and the stress absorbing or stress sink characteristics of the first oxide portion 31 (particularly during the modulated cooling segment) results in a substantially stress free oxide-substrate interface. Moreover, the defect density is reduced. Finally, segment 280 represents a further ramp down at a faster rate on the order of approximately 35-65°C per minute in an inert ambient such as pure nitrogen. Segment 290 is the boat pull at about 500°C in a pure nitrogen ambient.--

a3 cont'd.

(11) Please replace the paragraph beginning on page 14, line 28, with the following paragraph:

--Figure 14 presents various leakage plots for a p-type tub at a voltage of 2.0 volts. Plot 134 is for a gate oxide in accordance with the present invention having a thickness of 28 Å, and plot 135 is for a conventional oxide of the same thickness. Plot 136 is for an oxide of invention of the present disclosure having a thickness of 32 Å, while plot 137 is for a conventional oxide layer having a thickness of 32 Å. From Figs. 13 and 14 it can be appreciated that the oxide of the present invention offers a 8-10 times improvement leakage current. Moreover, with this significant improvement in leakage current, as one of ordinary skill in the art would readily appreciate, the charge control over the channel is improved, with improved sub-threshold characteristics (I_{off}).--

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(12) Please replace the title of the Application with the following title:

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